DEPARTMENT OF ATMOSPHERIC SCIENCE

About the Department

Our top-rated department focuses on graduate education, cutting-edge research, and public service. We currently have 19 faculty members, 80 graduate students, 50 full-time researchers, and an outstanding and dedicated support staff. Our diverse areas of research (https://www.atmos.colostate.edu/research) include Cloud Microphysics, Severe Storms and Mesoscale Meteorology, Atmospheric Chemistry and Air Quality, Radiation and Remote Sensing, Climate and Atmosphere-Ocean Dynamics, and Global Biogeochemical Cycles and Ecosystems. We offer graduate degrees at both the M.S. and Ph.D. levels. Graduate students typically find employment in government research laboratories, academic institutions, military services, and private industry.

For additional information on graduate programs and the application process, please visit the Department of Atmospheric Science (https://www.atmos.colostate.edu) website, Application Overview (https://www.atmos.colostate.edu/grad-prog/graduate-program), and Atmospheric Science Graduate Student Guide (http://www.atmos.colostate.edu/documents/GraduateStudentGuide2019.pdf).

Contact Information

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Undergraduate

No undergraduate major is offered. Undergraduates interested in atmospheric science at the graduate level are encouraged to major in engineering, physics, chemistry, mathematics, or atmospheric science.

Graduate

The department offers a Master of Science and a Doctor of Philosophy in Atmospheric Science.

M.S. Program

Students that complete the M.S. program will have acquired the knowledge and proficiency needed to seek employment in the field of atmospheric science. This knowledge and proficiency are gained through completion of a required core curriculum, elective graduate courses chosen from a wide selection of offerings, and by participation in scientific research with their advisors.

M.S. graduates are prepared for a wide choice of professionally satisfying work in private industry, the consulting field, and with many government agencies. Graduates of the M.S. program can also choose to continue their studies and research in the Ph.D. program. A student is eligible to seek admission to the Ph.D. program after successfully completing a thesis-based M.S. degree with a positive recommendation from their M.S. committee. Students holding thesis-based M.S. degrees from institutions other than CSU may be directly admitted into the Ph.D. program. These students follow the normal application procedures to our program.

In addition to meeting the formal credit requirements for the M.S., described below, all graduate students enrolled in the department are expected to attend the weekly department colloquium series. These colloquia are an important part of the total instructional program. Details can be found on the colloquium page (http://www.atmos.colostate.edu/colloquia) on the ATS website.

Prerequisites

- Bachelor of Science (B.S.) degree in physics, math, atmospheric science, engineering, chemistry, or related field with a cumulative GPA of at least 3.0
- Calculus-based math course sequence including differential equations and vector analysis
- Calculus-based physics course sequence including kinetics, electricity and magnetism, and some modern topics

Plan A (Thesis)

A minimum of 30 semester credits plus thesis is required. At least 19 credits must be earned in structured academic courses. 11 credits may be in special studies, graduate seminars, and research. Of the total 30 credits, 20 must be ATS subject code.

All MS students must complete the following required courses (required courses account for 13 credit hours):

- ATS 601 Atmospheric Dynamics I (2 credits)
- ATS 606 Introduction to Climate (2 credits)
- ATS 620 Thermodynamics and cloud physics (2 credits)
- ATS 621 Atmospheric Chemistry (2 credits)
- ATS 622 Atmospheric Radiation (2 credits)
- ATS 693 Responsible Research in Atmospheric Science (1 credit)
- One of the following:
  - ATS 640 Introduction to synoptic dynamics (2 credits)
  - ATS 641 Introduction to mesoscale dynamics (2 credits)

All MS students must also complete 6 elective credit hours in structured classes. Electives may include any structured class at the 500/600 level. With written advisor approval, electives may also include structured 700 level classes and/or structured graduate courses in other departments. Audits do not count towards the MS degree.

A student may substitute a required class for an alternative course if:

1. A course similar to the required class has already been completed at the graduate level with a grade of B or higher
2. The student’s advisor, the department head, and the instructor of the required course approve the substitution in writing.

A student’s program of study, and any deviations therein from department degree requirements, requires department head approval.

ATS 784 does not count toward the 19 structured credits. ATS 699A-O and ATS 784 are graded as S/U.

Ph.D. Program

The department offers a Ph.D. program for students who want to obtain the highest academic degree available in the field of atmospheric science. Students who earn a Ph.D. must demonstrate significant
intellectual achievement, high scholarly ability, and a great breadth of knowledge.

In addition to meeting the formal credit requirements for the Ph.D., described below, all graduate students enrolled in the department are expected to attend the weekly department colloquium series. These colloquia are an important part of the total instructional program. Details can be found on the colloquium page (http://www.atmos.colostate.edu/colloquia) on the ATS website.

Prerequisites
- Successful completion of an M.S. degree with thesis in atmospheric science, physics, math, engineering, chemistry, or related field
- Demonstration of aptitude for research

Course Requirements
- Ph.D. students must take a minimum of 42 semester credits beyond the (thesis option) master’s degree (or 72 semester credits beyond the bachelor’s degree). At least 21 credits beyond the master’s degree (or 37 credits beyond the bachelor’s degree) must be earned in courses numbered 500 or above.
- Ph.D. students are required to take two structured courses per academic year. Students must register for the courses, and only one may be taken as an audit. The structured courses can be selected from the 500, 600, or 700 level. With written advisor approval, the courses may also include structured graduate classes from other departments. When the student is within one semester of graduation, the student and advisor may petition the Department Head, in writing, for a waiver of the “two courses per year” requirement. While ATS 784 (Supervised College Teaching) is not considered a structured academic course, it is allowed to count towards the two courses per academic year Ph.D. requirement.
- Successful completion of ATS 693 (1 cr), Responsible Conduct of Research, offered every spring semester.
- Audits count towards the department’s requirement that all GRAs enroll for at least 15 credit hours each semester (section L). But audits do not count towards the total required course credits for the Ph.D., and may not be listed on the GS Form 6.

Evaluation Mechanisms
- Successful completion of the department preliminary exam that includes background, methods, and current research that applies to the specific area(s) encompassing the candidate’s proposed research topic
- Successful research topic proposal presentation
- Dissertation prepared under the mentorship of the student’s advisor and graduate committee that meets the following criteria: displays original and creative scholarship, contributes new knowledge to the field of atmospheric science, and expresses good literate style.
- Successful defense of a dissertation before the student’s graduate committee and any other members of the academic and scientific communities who desire to attend

The student’s Graduate Committee is charged with ensuring the student gains breadth in Atmospheric Science during his/her tenure in the program. Accordingly the Graduate Committee may make recommendations on coursework to be completed prior to graduation.